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PENSOFT

First record of *Histiotus velatus* I. Geoffroy St.-Hilaire, 1824 (Chiroptera, Vespertilionidae) in Salta province, Argentina

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Abstract
We present here the first record of *Histiotus velatus* I. Geoffroy St.-Hilaire, 1824 for the province of Salta, Argentina. Until now, in Argentina, this species was only known from Jujuy, Corrientes, and Misiones provinces. Our record adds a fourth province to the distribution of this species in the country and the second record for the Northwestern Argentina, rising to 39 the number of bat species in Salta. We captured three adult males with mist-nets placed in Parque Nacional El Rey. This site represents one of the last largest continuous blocks of protected forests, within a region affected by the greatest anthropic transformation (e.g. agricultural development, cattle grazing) of northwestern Argentina.

Keywords
Distribution, *Histiotus*, northwestern Argentina, Yungas.

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Introduction

Salta province includes a region of great geographical and biological complexity, and supports a wide array of habitats, from arid, high elevation, puna desert, and montane grasslands in the west, to montane rainforest in the central portions, to semiarid thorn scrub in the east, and arid Monte Desert in the south; it also has a diverse mix of ecotonal habitats (Ojeda and Mares 1989, Díaz et al. 2000). However, its natural vegetation has been so strongly affected that, at present, it is highly fragmented due mainly to agricultural development (Boletta et al. 2006; Hoyos et al. 2012). The mammals of the province were extensively studied (Mares et al. 1981, 1989; Ojeda and Mares 1989; Díaz et al. 2000) reflecting that it was the second most diverse province with respect to its bat fauna, with a total of 38 species (Barquez et al. 1999, 2011; Barquez and Díaz 2009).

Histiotus Gervais, 1856 is an endemic genus from South America containing eight species: *H. alienus* (Thomas, 1916); *H. diaphanopterus* Feijó et al., 2015; *H. humboldti* Handley, 1996; *H. laephotis* Thomas, 1916; *H. macrotus* (Poeppig, 1835); *H. magellanicus* (Philippi, 1866); *H. montanus* (Philippi and Landbeck, 1861); and *H. velatus* (Geoffroy St.-Hilaire, 1824) (Simmons 2005; Barquez 2006;Feijó et al. 2015; Díaz et al. 2016, 2019). It is important to mention that Handley and Gardner (2008) considered to *H. alienus*, *H. laephotis*, and *H.*

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magellanicus as subspecies of *H. montanus*. Five species are distributed in Argentina (Barquez et al. 1999, Barquez and Díaz 2009, Díaz et al. 2016), and four of them, *Histiotus laephotis*, *H. macrotus*, *H. montanus*, and *H. velatus*, are present in the northwest (Barquez 2006; Barquez and Díaz 2009). Until now, in the northwestern Argentina, *Histiotus velatus* was only known from Jujuy province. Here we report *H. velatus* for the province of Salta, Argentina, representing the first record of the species for the province, the second known locality for northwestern Argentina and the fourth argentine province for its distribution.

This species, in Argentina (Díaz 2012) and throughout its distribution, is listed as Data Deficient by the International Union for Conservation of Nature and Natural Resources (González and Barquez 2016), "...in view of continuing problems with its taxonomy as well as absence of recent information on its extent of occurrence, status and ecological requirements" (González and Barquez 2016: 1).

Methods

The survey was carried on between November 2017 and March 2018 in Parque Nacional El Rey, as part of an ecological study which included the use of mist nets randomly in different microhabitats inside the Park. The collection site was an open area of grasses with artificial lights close to the park buildings (Fig. 1). The specimen was originally preserved in alcohol 70%, and posteriorly prepared as skin, skull and skeleton, and deposited at the Colección Mamíferos Lillo (CML), Universidad Nacional de Tucumán, Tucumán, Argentina. Other two individuals of the species were captured, but released.

The locality of collection belongs to the Yungas ecoregion, characterized by montane subtropical deciduous forests (Brown et al. 2009; Martínez and Prado 2014). Study site belongs to a protected area, Parque Nacional El Rey, that was surrounded with land where deforestation has recently been intensified by the rapid expansion of soybean crops and cattle grazing (Zak et al. 2004; Hoyos et al. 2012; Prado et al. 2012, Hansen et al. 2013). The collection area is a prairie of natural vegetation, surrounded second growth forest and park buildings.

Figure 1. Collection site of the specimen of *Histiotus velatus*, an open area of grasses in Parque Nacional El Rey, Salta, Argentina.

In the Yungas vegetation there are tall trees such a *Cedrela angustifolia* Sessé and Moc. ex DC, *Enterolobium contortisiliquum* (Vell.) Morong, *Anadenanthera colubrina* (Vell.) Brenan, *Cinnamomum porphyrium* (Griseb.) Kosterm., and *Myrcianthes pungens (*O.Berg) D. Legrand (mato); smaller trees, including *Allophyllus edulis* (A. St.-Hil., A. Juss. and Cambess.) Hieron. ex Niederl., and *Celtis brasiliensis* (Gardner) Planch. (tala); and the shrubs *Urera baccifera* (L.) *Gaudich. Piper tucumanum* C. DC. and *Solanum* spp. (Cabrera 1976).

The identification of the species was made using identification keys published by Barquez et al. (1999) and Díaz et al. (2016) as well as by comparison with specimens of other species of the genus deposited at the CML (see Appendix).

Results

New record. Argentina: Salta province, Anta Department: Parque Nacional El Rey, a 200 m de la intendencia (24°43′05″S, 064°38′42″ W, 926 m a.s.l.) (Fig. 2), collected by Sofía Aramayo on January 23, 2018, wet season (summer in the southern hemisphere); an adult male (CML 13338). The released specimens were: two adult males captured on November 19, 2017 and on March 17, 2018.

Identification. In Salta there are also two other species of the genus *Histiotus* (Barquez and Díaz 2009), *H. laephotis* and *H. macrotus*, but the most distinguishing character of *H. velatus* is the pointed and triangular shaped ears, compared with the other two species that have rounded and oval shaped ears. The ears are connected by a ca 3 mm membrane in this species and in *H. laephotis*, which is lower in *H. macrotus* (2 mm); but in *H. laephotis* the color of the ears is yellowish while in *H. velatus* and *H. macrotus* is dark brown (Fig. 2). In other species from Argentina, such as *H. magellanicus* and *H. montanus* the connecting band between the ears are either absent or small (Díaz et al. 2016).

Histiotus velatus is a medium size species; in the external measurements, the male examined is slightly smaller than the females collected in Jujuy province (Table 1). The dorsal coloration of the specimen examined is dark brown with almost unicolored hairs, and pale drab ventrally with bicolored hairs (Fig. 3); it is slightly darker than other specimens examined from Jujuy province (CML 7059, 11916); the wings and ears membranes are dark drab but paler than *H. macrotus*. The skull is similar to those of the other species of *Histiotus*, with a rostrum narrower than that of *H. laephotis* and *H. macrotus*, without sagittal crest and

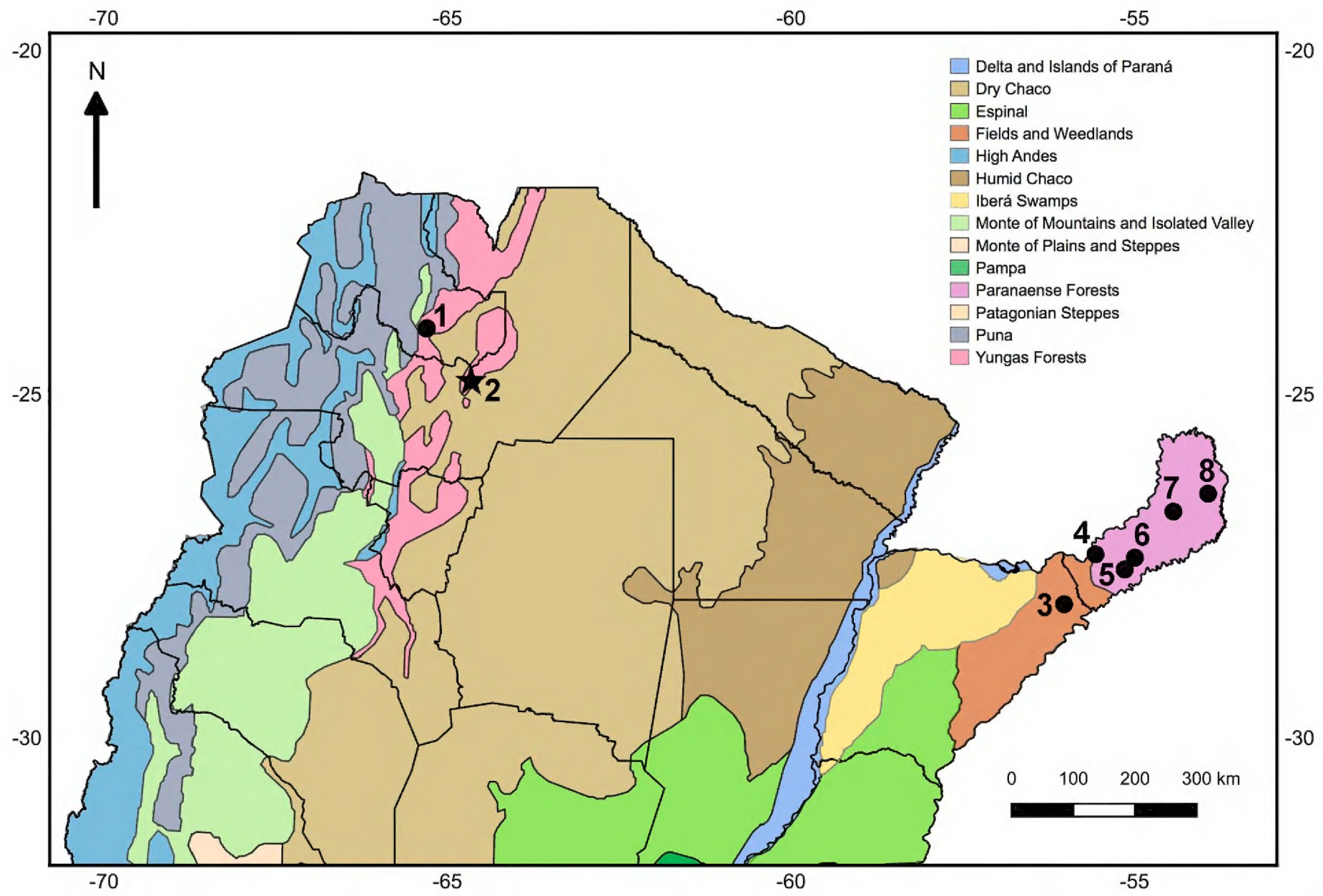

Figure 2. Distribution of *Histiotus velatus* in Argentina. Black dots indicate previous localities and the star shows the new one. 1 = Río Las Capillas, 15 km al N de Las Capillas por ruta 20, 24°02′00.38′′S, 065°06′41.91′′W (Dr. Manuel Belgrano, Jujuy). 2 = Parque Nacional El Rey, a 200 m de la intendencia, 24°43′05′′S, 064°38′42′′W (Anta, Salta). 3 = Virasoro, 28°02′49.1′′S, 056°00′34.7′′W (Santo Tomé, Corrientes). 4 = San Ignacio, 27°16′49′′S, 055°31′59′′W (San Ignacio, Misiones). 5 = Guaraní, 27°31′26.3′′S, 055°09′36.2′′W (Oberá, Misiones). 6 = Campo Ramón, 27°27′22.6′′S, 055°01′20.8′′W (Oberá, Misiones). 7 = Río Victoria, 26°57′51.7′′ S, 054°29′48.4′′W (Guaraní, Misiones). 8 = Frontera Tobuna, 26°28′12.53′′S, 053°53′29.0′′W (San Pedro, Misiones). Ecoregions classified according to Burkart et al. (1999).

well-marked postorbital constriction, and the postorbital process of the jugal, in the zygomatic arches, well-developed (Fig. 4).

Table 1. External and cranial measurements in mm (following Barquez et al. 1999) of the specimen of *Histiotus velatus* from Salta (CML 13338) compared with other two specimens from Jujuy province (Argentina).

Variables	CML 13338	CML 7059	CML 11916
Sex	Male	Female	Female
Total length	95	125	120
Tail length	43	59	56
Hindfoot length	10	10.6	8
Ear length	31	33	35
Weight	—	11	12
Forearm	47.4	46.5	48
Greatest length of skull	19.0	18.9	18.6
Condylobasal length	18.6	18.1	18.2
Postorbital constriction	4.2	4.0	4.0
Zygomatic breadth	10.5	10.8	10.4
Breadth of braincase	8.2	8.1	7.9
Mastoideal breadth	9.4	9.5	9.2
Width across C-C	4.9	4.9	4.7
Width across M2-M2	6.4	6.5	6.3
Length of maxillary toothrow	6.4	6.3	6.2
Length of mandible	12.8	13.3	12.8
Length of mandible toothrow	6.7	6.7	6.6

Figure 3. Living specimen of *Histiotus velatus* at the moment of capture in Parque Nacional El Rey, Salta, Argentina.

Figure 4. Dorsal, ventral, and lateral views of the skull and lateral view of the mandible of *Histiotus velatus* (CML 13338).

Discussion

Histiotus velatus is distributed in Argentina, Bolivia, Brazil, Paraguay, Perú, and Uruguay (Díaz et al. 2016). In Argentina, this species is known from just a few localities in the northeast and northwest regions (Fig. 2). The new record of *H. velatus* from the province of Salta adds a new locality to Northwestern Argentina, because the only known previous record was from Jujuy province (Barquez and Díaz 2001, 2007; Barquez 2006; Gamboa Alurralde et al. 2016). The first records of this species for Argentina were obtained in 1970 in the province of Misiones, while the specimens from Jujuy (in the northwest) were obtained in 1997, almost 30 years later, and then recently in 2012, after continuous efforts for collecting bats, which reflects the scarcity and rarity of the species in the country. This species needs more studies to determine if the populations along its distributional range all belong to a unique entity (see also González and Barquez 2016).

On the other hand, it has to be mentioned that little is known about different aspects of its biology which, added to the fact that fragmentation and destruction of its habitat in Northwestern Argentina is within the highest rates of deforestation on a planetary scale (Hansen et al. 2013), should highlight the need of having more precise information about its distribution, conservation status, and ecology.

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Authors' Contributions

SA and ED participates in specimens' collection, MMD reviewed and identified the specimens at the collection Colección Mamíferos Lillo; SA, MMD, MDM and ED wrote the text.

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Appendix

Specimens examined. For each specimen, the localities are listed alphabetically by province and department, then by specific site and coordinates between parentheses, numbers of specimens, collection acronym and number. The acronym used in the text is CML (Colección Mamíferos Lillo), Tucumán, Argentina.

Histiotus laephotis (3). JUJUY. Dr. Manuel Belgrano: Cucho, San Salvador de Jujuy (24°14′28.2″S, 065° 14′59.3″W; 1210 m a.s.l.), 1 (CML 1682); Ledesma: Parque Nacional Calilegua, Arroyo Sauzalito (23°38′33″S, 064° 36′6.71″W; 474 m a.s.l.), 1 (CML 2923); San Pedro: Río Lavayén, app. 1 km al N de Santa Rita (24°27′41.6″S, 064°50′45.28″W; 536 m a.s.l.), 1 (CML 7058).

Histiotus macrotus (10). JUJUY. Humahuaca: 8 km al S de Tres Cruces al lado de ruta 9 (22°56′18.8″S, 065° 31′16.59″W; 3619 m a.s.l.), 3 (CML 5408, 5409, 6066); Yavi: 6.8. km al SE de Suripujio sobre ruta provincial Nº 5 (22°13′27″S, 065°16′12.2″W; 3991 m a.s.l.), 1 (CML 7891). SALTA. Molinos: Laguna El Brealito (25°17′ 22.5″S, 066°22′04.8″W; 2585 m a.s.l.), 4 (CML 7893, 1895, 7896, 7897); San Carlos: 20 km al NW de Cafayate, camino a El Barreal (25°57′56.1″S, 065°55′33.85″W; 1613 m a.s.l.), 2 (CML 5406, 5407).

Histiotus velatus (3). JUJUY. Dr. Manuel Belgrano: Río Las Capillas, 15 km al N de Las Capillas por ruta 20 (24°02′00.38″S, 065°06′41.91″W; 998 m a.s.l.), 2 (CML 7059, 11916); SALTA. Anta: Parque Nacional El Rey, a 200 m de la intendencia (24°43′05″S, 064°38′42″W; 926 m a.s.l.), 1 (CML 13338).